

Virtual Mentor

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CLINICAL PEARL

Diagnosing Acute Low Back Pain

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Low back pain is one of the leading causes of primary care and emergency room visits and job-related disability in the United States [1]. Back pain is sorted into three categories, differentiated by the duration of symptoms. Acute back pain, which is the focus of this article, is classified as pain lasting 6 weeks or less, subacute back pain is pain that has been present between 6 and 12 weeks, and chronic back pain is pain that persists longer than 12 weeks [2].

Etiologies of low back pain include (but are certainly not limited to) mechanical injury (e.g., muscle sprain or spasm, ligament strain, facet joint disruption), arthritis, sciatica (lumbar radiculopathy), spinal fracture, malignancy, connective tissue disease, infection (e.g., vertebral osteomyelitis, epidural abscess), cauda equina syndrome, metabolic causes (e.g., hyperparathyroidism), abdominal or retroperitoneal visceral or vascular processes, psychogenic pain, and malingering. Careful history-taking and physical examination are crucial to diagnosing the etiology of back pain.

The patient in [this case](#) is experiencing sciatica, pain that originates in the lower back and radiates down the lateral or posterior thigh and occasionally to the ankle or foot. It may be associated with weakness, numbness and/or tingling in the affected leg. It is caused by injury to or compression of the sciatic nerve, which is formed by the nerve roots of L4, L5, S1, S2, and S3 [3-7]. It is important to understand that sciatica is a symptom, not a medical condition in its own right. Common causes of sciatica include herniated discs, degenerative disc disease, spinal stenosis, piriformis syndrome, pelvic injury or fracture, and tumors.

During history taking and physical examination for lower back pain and particularly sciatica, it is important to look for clues to the cause. Red flags in the patient's history include past cancer, fever, unexplained weight loss, immunosuppression, extended use of steroids, intravenous drug use, urinary tract symptoms, trauma, and bowel or bladder incontinence or retention. Physical findings that are cause for concern include decreased or loss of anal sphincter tone, saddle anesthesia, significant motor weakness, vertebral tenderness, and persistent or worsening neurological symptoms [8]. The presence or absence of these red flags dictate whether further workup is warranted.

Three types of imaging modalities can be used to further elucidate the diagnosis of back pain: plain radiographs (x-rays), computed tomography (CT), and magnetic

resonance imaging (MRI). Plain radiographs consist of anteroposterior and lateral lumbosacral spine views. Pelvic and hip x-rays may be considered if it is felt the pain may be referred from the hip or pelvis. Plain films can show evidence of fracture, malignancy, spondylolisthesis, degenerative changes, disc space narrowing, infection, and prior surgery. They do not assess discs, ligaments, nerve roots, epidural fat, or the spinal canal. Also, the sensitivity of plain films for detecting malignancies and infections is subpar [9]. Use of plain films is generally limited to cases of recent significant trauma, recent mild trauma in a patient over age 50, a history of prolonged glucocorticoid use or osteoporosis, or cases in which the patient is more than 70 years old.

CT and MRI scans of the lumbosacral spine are more sensitive than plain films but are only indicated for patients with acute back pain if clinical findings suggest possible emergent conditions affecting the spine, including cauda equina syndrome, infection, fracture with neurologic compression, acute radiculopathy with progressive neurologic deficits, and tumors. CT is superior to MRI for revealing bony abnormalities (e.g., sacroiliac joint disease, fractures) and may be particularly useful for further elucidation when plain films are abnormal or inconclusive in the setting of recent trauma. However, MRI is preferred to CT because it provides better visualization of nonbony structures (e.g., discs, nerves) and does not subject patients to radiation (the radiation exposure from a lumbosacral CT can be more than 10 times as high as that from a plain film) [10]. Choice of imaging modality may also be affected by contraindications to MRI (e.g., metal implants) and MRI availability.

There are reasons to think twice before performing any imaging on a patient who has acute low back pain and no red flags. First, and most importantly, the vast majority of cases of acute low back pain are mechanical or nonpathological; less than 5 percent of acute low back pain cases are due to serious systemic pathology [11]. Secondly, up to 90 percent of patients with acute lower back pain recover within 2 weeks [12]. Given the rapid resolution of most back pain cases, early imaging may expose patients to unwarranted radiation and risk of malignancy.

Thirdly, radiographic findings do not necessarily correlate with patients' symptoms or presentation. Treating patients based on the radiographic findings alone may lead to unnecessary interventions, health care expenses, and patient anxiety. For example, research has shown that as many as 60 percent of people without back symptoms have disk bulges and protrusions on MRI [13].

Lastly, early imaging in cases of acute low back pain where no sign of serious etiology is present has not been shown to improve outcome or patient satisfaction. One study showed that depiction of stenosis, nerve root compression, or both on MRI in the first 48 hours after onset of acute radicular back pain did not affect the outcome after 6 weeks of conservative management [14]. Other research has shown that MRI evaluation to provide reassurance does not lead to better prognosis [15] and that patient awareness of imaging findings does not affect the outcome and is associated with a reduced sense of well-being for the patient [16]. A review of

predictive studies of acute low back pain revealed that psychosocial variables (e.g., coping behaviors, psychiatric comorbidities) are much stronger predictors of long-term disability than radiographic findings [17].

The bottom line is that 80 percent of adults seek care at some point for acute low back pain [18] and, in the large majority of cases, the pain typically resolves with conservative management. To order MRIs (or other imaging) for every patient who comes in with acute back pain is a superfluous use of precious health care resources and dollars. The most reasonable approach, in the absence of red flags, is conservative management; imaging should only be considered if the patient does not improve as expected or if red flags subsequently appear. It is also extremely important to take the time to explain the diagnosis, treatment, and expected management plan to patients. Studies have shown that patients who feel that they have been given a sufficient explanation for the etiology of their problem are less likely to request diagnostic tests and more likely to be satisfied with the visit [19, 20]. Reassurance is key.

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